REPLACEMENT ABSTRACT

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A method and system for intrinsic timescale decomposition, filtering, and automated analysis of signals of arbitrary origin or timescale including receiving an input signal, determining a baseline segment and a monotonic residual segment with strictly negative minimum and strictly positive maximum between two successive extrema of the input signal, and producing a baseline output signal and a residual output signal. The method and system also includes determining at least one instantaneous frequency estimate from a proper rotation signal, determining a zero-crossing and a local extremum of the proper rotation signal, and applying interpolation thereto to determine an instantaneous frequency estimate thereof. The method and system further includes determining at least one instantaneous frequency estimate from a proper rotation signal, extracting an amplitude-normalized half wave therefrom and applying an arcsine function to the amplitude-normalized half wave to determine an instantaneous frequency estimate of the proper rotation signal.